	Type	L #	Hits	Search Text	DBs	Time Stamp
1	BRS	L1	10	(josephson adj junction) and mesoscopic	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/05/07 09:41
2	BRS	L2	4	(josephson adj junction) and (single adj electron adj transistor)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2002/05/07 09:42

3/9/11 **(Item 11 from file: 2)**
DIALOG(R)File 2:INSPEC

6256746 INSPEC Abstract Number: A1999-13-7450-011, B1999-07-3240C-005, C1999-07-4270-001

Title: Environmentally decoupled sds-wave Josephson junctions for quantum computing

Author(s): Ioffe, L.B.; Geshkenbein, V.B.; Feigel'man, M.V.; Fauchere, A.L.; Blatter, G.
Author Affiliation: Dept. of Phys. & Astron., Rutgers Univ., Piscataway, NJ, USA

Journal: Nature vol.398, no.6729 p.679-81
Publisher: Macmillan Magazines,
Publication Date: 22 April 1999 Country of Publication: UK
CODEN: NATUAS ISSN: 0028-0836
SICI: 0028-0836(19990422)398:6729L.679:EDWJ;1-V
Material Identity Number: N003-1999-017
U.S. Copyright Clearance Center Code: 0028-0836/99/$12.00+2.00
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P); Theoretical (T)

Abstract: Quantum computers have the potential to outperform their classical counterparts in a qualitative manner, as demonstrated by algorithms which exploit the parallelism inherent in the time evolution of a quantum state. In quantum computers, the information is stored in arrays of quantum two-level systems (qubits), proposals for which include utilizing trapped atoms and photons, magnetic moments in molecules and various solid-state implementations, but the physical realization of qubits is challenging because useful quantum computers must overcome two conflicting difficulties: the computer must be scalable and controllable, yet remain almost completely detached from the environment during operation, in order to maximize the phase coherence time. We report a concept for a solid-state "quiet" **qubit** that can be efficiently decoupled from the environment. It is based on macroscopic quantum coherent states in a superconducting quantum interference loop. Our two-level system is naturally bistable, requiring no external bias: the two basis states are characterized by different macroscopic phase drops across a **Josephson junction** , which may be switched with minimal external contact. (21 Refs)

Subfile: A B C
Descriptors: Josephson effect; quantum computing; SQUIDs
Identifiers: environmentally decoupled sds-wave Josephson junctions; quantum computers; parallel algorithms; quantum state time evolution; quantum two-level system arrays; solid-state quiet **qubit** ; trapped atoms; photons; molecular magnetic moments; solid-state implementations; scalable computers; controllable computers; phase coherence time; macroscopic quantum coherent states; superconducting quantum interference loop; SQUID loop; bistable system; basis states; macroscopic phase drops; phase switching; external contact
Class Codes: A7450 (Superconductor tunnelling phenomena, proximity effects, and Josephson effect); A0365 (Quantum theory; quantum mechanics); B3240C (Superconducting junction devices); C4270 (Quantum computing theory)

?

3/9/29 (Item 10 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07650149 Genuine Article#: 192BL Number of References: 18
Title: Coherent control of macroscopic quantum states in a single-Cooper-pair box
Author(s): Nakamura Y (REPRINT) ; Pashkin YA; Tsai JS
Corporate Source: NEC FUNDAMENTAL RES LABS,/IBARAKI/OSAKA 3058051/JAPAN/ (REPRINT); JAPAN SCI & TECHNOL CORP,CREST/KAWAGUCHI/SAITAMA 3320012/JAPAN/
Journal: NATURE, 1999, V398, N6730 (APR 29), P786-788
ISSN: 0028-0836 Publication date: 19990429
Publisher: MACMILLAN MAGAZINES LTD, PORTERS SOUTH, 4 CRINAN ST, LONDON N1 9XW, ENGLAND
Language: English Document Type: ARTICLE
Geographic Location: JAPAN
Subfile: CC PHYS--Current Contents, Physical, Chemical & Earth Sciences; CC LIFE--Current Contents, Life Sciences; CC AGRI--Current Contents, Agriculture, Biology & Environmental Sciences
Journal Subject Category: MULTIDISCIPLINARY SCIENCES
Abstract: A nanometre-scale superconducting electrode connected to a reservoir via a **Josephson junction** constitutes an artificial two-level electronic system: a single-Cooper-pair box. The two levels consist of charge states (differing by 2e, where e is the electronic charge) that are coupled by tunnelling of Cooper pairs through the junction. Although the two-level system is macroscopic, containing a large number of electrons, the two charge states can be coherently superposed(1-4). The Cooper-pair box has therefore been suggested(5-7) as a candidate for a quantum bit or '**qubit** '-the basic component of a quantum computer. Here we report the observation of quantum oscillations in a single-Cooper-pair box. By applying a short voltage pulse via a gate electrode, we can control the coherent quantum state evolution: the pulse modifies the energies of the two charge states nonadiabatically, bringing them into resonance. The resulting state-a superposition of the two charge states-is detected by a tunnelling current through a probe junction. Our results demonstrate electrical coherent control of a **qubit** in a solid-state electronic device.

3/9/16 (Item 4 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05590410 E.I. No: EIP00065223235
Title: Josephson junction **based quantum computing**
Author: Makhlin, Yuriy; Schoen, Gerd; Shnirman, Alexander
Corporate Source: Universitaet Karlsruhe, Karlsruhe, Ger
Source: Applicable Algebra in Engineering, Communications and Computing v 10 n 4 2000. p 375-382
Publication Year: 2000
CODEN: AAECEW ISSN: 0938-1279
Language: English
Document Type: JA; (Journal Article) Treatment: T; (Theoretical)
Journal Announcement: 0008W1
Abstract: Among the physical realizations of the elements required for quantum computation nano-scale electronic devices left bracket 2, 10, 12, 16 right bracket are very promising. They can be easily integrated into electronic circuits and scaled up to large numbers of qubits. Here we describe qubits based on low-capacitance Josephson junctions. In these systems Coulomb blockade effects allow the control of the charge on a superconducting island. They constitute quantum bits, with logical states differing by the charge on one island. Single- and two-bit operations can be performed by manipulating applied gate voltages. The phase coherence time is sufficiently long to allow a series of these steps. In addition to the manipulation of qubits, the resulting quantum state can be read out by coupling a single-electron transistor capacitively to the **qubit** . (Author abstract) 17 Refs.
Descriptors: Quantum theory; **Josephson junction** devices; Transistors
Identifiers: Quantum computing; Single electron transistors
Classification Codes:
931.4 (Quantum Theory); 704.2 (Electric Equipment); 714.2 (Semiconductor Devices & Integrated Circuits)
931 (Applied Physics); 704 (Electric Components & Equipment); 714 (Electronic Components)
93 (ENGINEERING PHYSICS); 70 (ELECTRICAL ENGINEERING); 71 (ELECTRONICS & COMMUNICATIONS)

3/9/5 (Item 5 from file: 2)
DIALOG(R)File 2:INSPEC

6620988 INSPEC Abstract Number: B2000-07-3240C-039, C2000-07-5110E-001
Title: Josephson junction **based quantum computing**
Author(s): Makhlin, Y.; Schon, G.; Shnirman, A.
Author Affiliation: Inst. fur Theor. Festkorperphysik, Karlsruhe Univ., Germany
Journal: Applicable Algebra in Engineering, Communication and Computing vol.10, no.4-5 p.375-82
Publisher: Springer-Verlag,
Publication Date: 2000 Country of Publication: Germany
CODEN: AAECEW ISSN: 0938-1279
SICI: 0938-1279(2000)10:4/5L.375:JJBQ;1-J
Material Identity Number: O519-2000-003
Language: English Document Type: Journal Paper (JP)
Treatment: Practical (P)
Abstract: Among the physical realizations of the elements required for quantum computation nano-scale electronic devices are very promising. They can be easily integrated into electronic circuits and scaled up to large numbers of qubits. Here we describe qubits based on low-capacitance Josephson junctions. In these systems Coulomb blockade effects allow the control of the charge on a superconducting island. They constitute quantum bits, with logical states differing by the charge on one island. Single- and two-bit operations can be performed by manipulating applied gate voltages. The phase coherence time is sufficiently long to allow a series of these steps. In addition to the manipulation of qubits, the resulting quantum state can be read out by coupling a single-electron transistor capacitively to the **qubit** . (17 Refs)
Subfile: B C
Descriptors: quantum gates; superconducting junction devices
Identifiers: quantum computing; nano-scale electronic devices; qubits; Josephson junctions; Coulomb blockade effects; quantum bits; **Josephson junction** ; single-electron transistor
Class Codes: B3240C (Superconducting junction devices); B1265B (Logic circuits); C5110E (Other logic elements); C4270 (Quantum computing theory)

?

3/9/21 **(Item 2 from file: 34)**
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

09426740 Genuine Article#: 402TD Number of References: 22

Title: Nanoscale superconducting quantum bits

Author(s): Makhlin Y (REPRINT) ; Schon G; Shnirman A
Corporate Source: Univ Karlsruhe,Inst Theoret Festkorperphys,Kaiserstr 12/D-76128 Karlsruhe//Germany/ (REPRINT); Univ Karlsruhe,Inst Theoret Festkorperphys,D-76128 Karlsruhe//Germany/; LD Landau Theoret Phys Inst,Moscow 117940//Russia/; Forschungszentrum Karlsruhe,Inst Nanotechnol,D-76021 Karlsruhe//Germany/

Journal: PHYSICA C, 2001, V350, N3-4 (FEB 15), P161-165
ISSN: 0921-4534 Publication date: 20010215
Publisher: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
Language: English Document Type: ARTICLE
Geographic Location: Germany; Russia
Journal Subject Category: PHYSICS, APPLIED

Abstract: Various physical systems were proposed for quantum information processing. Among those nanoscale devices appear most promising for integration in electronic circuits and large-scale applications. We discuss **Josephson junction** circuits in two regimes where they can be used for quantum computing. These systems combine intrinsic coherence of the superconducting state with control possibilities of single-charge circuits. In the regime where the typical charging energy dominates over the Josephson coupling, the low-temperature dynamics is limited to two states differing by a Cooper-pair charge on a superconducting island. In the opposite regime of prevailing Josephson energy, the phase (or flux) degree of freedom can be used to store and process quantum information. Under suitable conditions the system reduces to two states with different flux configurations. Several qubits can be joined together into a register. The quantum state of a **qubit** register can be manipulated by voltage and magnetic field pulses. The qubits are inevitably coupled to the environment. However, estimates of the phase coherence time show that many elementary quantum logic operations can be performed before the phase coherence is lost. In addition to manipulations, the final state of the qubits has to be read out. This quantum measurement process can be accomplished using a single-electron transistor for charge Josephson qubits, and a d.c.-SQUID for flux qubits. Recent successful experiments with superconducting qubits demonstrate for the first time quantum coherence in macroscopic systems. (C) 2001 Elsevier Science B.V. All rights reserved.

Descriptors--Author Keywords: Josephson junctions ; quantum computation ; quantum measurement
Identifiers--KeyWord Plus(R): SINGLE-ELECTRON TRANSISTOR; JOSEPHSON-JUNCTIONS; COMPUTATION

3/9/13 (Item 1 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)

05732953 E.I. No: EIP00125434765

Title: Optical coherent control in materials with stripe phase

Author: Alam, S.; Rahman, M.O.
Corporate Source: Electrotechnical Lab, Ibaraki, Jpn

Conference Title: Challenges in Process Integration and Device Technology
Conference Location: Santa Clara, CA, USA Conference Date: 20000918-20000919
Sponsor: SPIE-The International Society for Optical Engineering
E.I. Conference No.: 57696
Source: Proceedings of SPIE - The International Society for Optical Engineering v 4181 2000. Society of Photo-Optical Instrumentation Engineers, Bellingham, WA, USA. p 125-132
Publication Year: 2000
CODEN: PSISDG ISSN: 0277-786X
Language: English
Document Type: CA; (Conference Article) Treatment: T; (Theoretical); X; (Experimental)
Journal Announcement: 0101W4

Abstract: The possibility of using nano-stripes as an alternative to quantum dots as a candidate in the construction of quantum bit or **qubit** is discussed. The possibility of the coherent optical control of nanofabricated quantum system is also presented. A proposed system by Nakamura et al which is a nanometer-scale superconducting electrode connected to a reservoir via a **Josephson junction** is examined. 7 Refs.

Descriptors: **Josephson junction** devices; Nanostructured materials; Coherent light; Electrodes; Semiconductor quantum dots; Quantum theory
Identifiers: Quantum stripe
Classification Codes:
708.3 (Superconducting Materials); 933.1 (Crystalline Solids); 741.1 (Light/Optics); 704.1 (Electric Components); 714.2 (Semiconductor Devices & Integrated Circuits); 931.4 (Quantum Theory)
708 (Electric & Magnetic Materials); 933 (Solid State Physics); 741 (Optics & Optical Devices); 704 (Electric Components & Equipment); 714 (Electronic Components); 931 (Applied Physics)
70 (ELECTRICAL ENGINEERING); 93 (ENGINEERING PHYSICS); 74 (OPTICAL TECHNOLOGY); 71 (ELECTRONICS & COMMUNICATIONS)
?

3/9/28 (Item 9 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci

07755505 Genuine Article#: 204MC Number of References: 416
Title: Qubit **devices and the issue of quantum decoherence**
Author(s): Brandt HE
Corporate Source: USA,RES LAB/ADELPHI//MD/20783
Journal: PROGRESS IN QUANTUM ELECTRONICS, 1998, V22, N5-6, P257-370
ISSN: 0079-6727 Publication date: 19980000
Publisher: PERGAMON-ELSEVIER SCIENCE LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND
Language: English Document Type: REVIEW
Geographic Location: USA
Journal Subject Category: ENGINEERING, ELECTRICAL & ELECTRONIC
Abstract: The exciting new field of quantum information science and technology is burgeoning with revolutionary new advances in the areas of quantum communication, quantum information processing, quantum computing, and quantum cryptography. Potential useful products of these advances include a wide variety of innovative **qubit** devices, ranging from quantum games and quantum teleporters to quantum computers and quantum robots. The major obstacle to the successful development of these devices is the phenomenon of quantum decoherence. This brief survey article gives reviews of a full gamut of potential **qubit** devices, alternating with expository discussions of the issue of quantum decoherence as it relates to the possible practical development of these devices. The **qubit** devices examined here include an interaction-free detector, a quantum key receiver, quantum games, various quantum gates, **qubit** entanglers, quantum dense coders, Bell-state analyzers, entanglement swappers, quantum teleporters, quantum repeaters, entangled atomic clocks, quantum copiers, various quantum computers, and quantum robots. (C) 1999 Elsevier Science Ltd. All rights reserved.
Identifiers--KeyWord Plus(R): NUCLEAR-MAGNETIC-RESONANCE; ERROR-CORRECTING CODES; **JOSEPHSON -JUNCTION** ARRAYS; NONCLASSICAL MOTIONAL STATES; PODOLSKY-ROSEN CHANNELS; TRAPPED ATOMIC IONS; COLD CESIUM ATOMS; OPTICAL LATTICES; SINGLE-ELECTRON; NOISY CHANNELS

6715939 INSPEC Abstract Number: B2000-11-1265B-029, C2000-11-5110E-001

Title: Nano-electronic circuits as quantum bits

Author(s): Makhlin, Y.; Schon, G.; Shnirman, A.
Author Affiliation: Inst. fur Theor. Festkorperphys., Karlsruhe Univ., Germany

Conference Title: 2000 IEEE International Symposium on Circuits and Systems. Emerging Technologies for the 21st Century. Proceedings (IEEE Cat No.00CH36353) Part vol.2 p.241-4 vol.2
Publisher: Presses Polytech. Univ. Romandes, Lausanne, Switzerland
Publication Date: 2000 Country of Publication: Switzerland 5 vol.(viii+813+768+769+768+760) pp.
ISBN: 0 7803 5482 6 Material Identity Number: XX-2000-01653
U.S. Copyright Clearance Center Code: 0 7803 5482 6/2000/$10.00
Conference Title: ISCAS 2000 Geneva. 2000 IEEE International Symposium on Circuits and Systems. Emerging Technologies for the 21st Century. Proceedings
Conference Sponsor: IEEE Circuits & Syst. Soc
Conference Date: 28-31 May 2000 Conference Location: Geneva, Switzerland
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P); Theoretical (T); Experimental (X)

Abstract: Quantum information processing systems can be used in a variety of applications. Among proposed realizations of quantum bits nano-electronic circuits appear most promising for integration in electronic circuits and large-scale applications. We discuss **Josephson junction** circuits in two regimes where they can be used for quantum computing. In one limit, two logic states of the quantum bit differ by a Cooper pair charge, 2e, on a superconducting island. In the other limit different magnetic fluxes penetrate a superconducting loop in two states. Single- **qubit** and two-**qubit** logic operations can be performed by means of voltage or current pulses. Weak coupling to the environment allows a series of these elementary steps before the phase coherence is lost. To read out the result of the computation a quantum measurement is needed. For charge qubits this can be accomplished by coupling a single-electron transistor (SET) capacitively to the **qubit** . Monitoring the current in the transistor one can extract the information about the state of the **qubit** . We discuss recent experiments and present a suitable set of circuit parameters available with the present-day technology. (14 Refs)

Subfile: B C
Descriptors: Cooper pairs; nanotechnology; quantum computing; single electron transistors; superconducting logic circuits
Identifiers: nano-electronic circuits; quantum bits; quantum information processing systems; **Josephson junction** circuits; quantum computing; logic states; Cooper pair charge; superconducting island; superconducting loop; single-**qubit** logic operations; two-**qubit** logic operations; phase coherence; single-electron transistor; circuit parameters
Class Codes: B1265B (Logic circuits); B3240C (Superconducting junction devices); B2560X (Quantum interference devices); C5110E (Other logic elements); C4270 (Quantum computing theory); C5120 (Logic and switching circuits)